

CLAIMS

What is claimed is:

1. A method comprising:

receiving a request from a first client device to multicast a file as a plurality of packets of data from a server device to multiple client devices; transmitting the plurality of packets of data from a server to the multiple client devices using a multicast trivial file transfer protocol (TFTP); and applying, by the server, one or more flow control techniques not defined by the multicast TFTP.

2. The method of claim 1 wherein applying, by the server, one or more flow control techniques not defined by multicast TFTP comprises delaying a start of the transmission of the plurality of packets.

3. The method of claim 1 wherein applying, by the server, one or more flow control techniques not defined by multicast TFTP comprises:

determining whether a request to download the file is a subject of an existing multicast download session; and causing the multiple client devices to join an existing multicast group corresponding to the existing multicast download session.

4. The method of claim 1 wherein applying, by the server, one or more flow control techniques not defined by multicast TFTP comprises modifying quality of service based, at least in part, on resource conditions.

5. The method of claim 4 wherein modifying the quality of service comprises one or more of: modifying block size and modifying timeout length.

6. The method of claim 1 wherein applying, by the server, one or more flow control techniques not defined by multicast TFTP comprises reducing a packet transmission rate.

7. The method of claim 1 wherein applying, by the server, one or more flow control techniques not defined by multicast TFTP comprises retransmitting a most recently transmitted packet in response to receiving an unexpected packet.

8. A server device comprising:

a network interface to receive messages from one or more client devices including requests to download a file stored by the server device;
a memory coupled with the network interface to store the file; and
a processor coupled with the memory and the network interface to receive a request from a first client device of the one or more client devices to multicast

the file as a plurality of packets of data from the server device to the one or more client devices, transmit the plurality of packets of data from a server to the one or more client devices using a multicast trivial file transfer protocol (TFTP), and apply one or more flow control techniques not defined by the multicast TFTP.

9. The server of claim 8 wherein the one or more flow control techniques not defined by multicast TFTP comprises delaying a start of the transmission of the plurality of packets.

10. The server of claim 8 wherein the one or more flow control techniques not defined by multicast TFTP comprises determining whether a request to download the file is a subject of an existing multicast download session, and causing the multiple client devices to join an existing multicast group corresponding to the existing multicast download session.

11. The server of claim 8 wherein the one or more flow control techniques not defined by multicast TFTP comprises modifying quality of service based, at least in part, on resource conditions.

12. The server of claim 11 wherein modifying the quality of service comprises one or more of: modifying block size and modifying timeout length.

13. The server of claim 8 wherein the one or more flow control techniques not defined by multicast TFTP comprises reducing a packet transmission rate.

14. A computer-readable medium having stored thereon instructions that, when executed by one or more processors, cause the one or more processors to:

receive a request from a first client device to multicast a file as a plurality of packets of data from a server device to multiple client devices;

transmit the plurality of packets of data from a server to the multiple client devices using a multicast trivial file transfer protocol (TFTP); and

apply, by the server, one or more flow control techniques not defined by the multicast TFTP.

15. The medium of claim 14 wherein the instructions that cause the one or more processors to apply, by the server, one or more flow control techniques not defined by multicast TFTP comprise instructions that, when executed, cause the one or more processors to delay a start of the transmission of the plurality of packets.

16. The medium of claim 14 wherein the instructions that cause the one or more processors to apply, by the server, one or more flow control

techniques not defined by multicast TFTP comprise instructions that, when executed, cause the one or more processors to:

determine whether a request to download the file is a subject of an existing multicast download session; and
cause the multiple client devices to join an existing multicast group corresponding to the existing multicast download session.

17. The medium of claim 14 wherein the instructions that cause the one or more processors to apply, by the server, one or more flow control techniques not defined by multicast TFTP comprise instructions that, when executed, cause the one or more processors to modify quality of service based, at least in part, on resource conditions.

18. The medium of claim 14 wherein the instructions that cause the one or more processors to apply, by the server, one or more flow control techniques not defined by multicast TFTP comprise instructions that, when executed, cause the one or more processors to reduce a packet transmission rate.

19. A system comprising:

one or more processors;
a network interface coupled with the one or more processors; and

a storage medium coupled with the one or more processors having stored thereon instructions that, when executed, cause the one or more processors to receive a request from a first client device to multicast a file as a plurality of packets of data to multiple client devices, transmit the plurality of packets of data using a multicast trivial file transfer protocol (TFTP), and apply one or more flow control techniques not defined by the multicast TFTP.

20. The system of claim 19 wherein the instructions that cause the one or more processors to apply one or more flow control techniques not defined by multicast TFTP comprise instructions that, when executed, cause the one or more processors to delay a start of the transmission of the plurality of packets.

21. The medium of claim 19 wherein the instructions that cause the one or more processors to apply one or more flow control techniques not defined by multicast TFTP comprise instructions that, when executed, cause the one or more processors to modify quality of service based, at least in part, on resource conditions.

22. The medium of claim 19 wherein the instructions that cause the one or more processors to apply one or more flow control techniques not defined by multicast TFTP comprise instructions that, when executed, cause the one or more processors to reduce a packet transmission rate.